Part Four - Alternative to Avoid Adverse Impact

Various alternatives were considered which not only deal with rehabilitation treatments to the bridge, but also the potential reinstallation of redundant water main across the bridge.

Do Nothing

The Do Nothing alternative addresses or resolves adverse impacts on all treatment methods of parapet and water line removal (800.9 (b)(1). It also resolves adverse impacts directly related to the visual quality of the bridge appearance and Brandywine Park (800.9(b)(3). However, the Do Nothing alternative does not consider the purpose and intent of the project as discussed in Part One of this document. Existing conditions have already down posted the weight limit to a critical action of 3 tons. The southwest wall on the bridge which has rotated outward as much as 6". It is currently being monitored. At some point, the bridge can no longer handle freeze thaw activity in the winter, vehicle stress, general fatigue, vehicle traffic on the bridge. It is likely that the bridge will be closed to all forms of transportation access sometime this winter (1996-97).

Ignoring a mandatory maintenance/rehabilitation bridge project will lead to further deterioration of the bridge, and thus, it would continue to deteriorate to a point where it would fail. As a result, if nothing is done, severe injuries, and/or fatalities could potentially result as well as loss to a historic resource would occur. The Do Nothing may violate various Environmental Justice criteria established under the FHWA. The Do Nothing option would also result in adverse effect in that there would be neglect of the property, resulting in further deterioration and eventual removal.

Therefore will all respects, the Do Nothing solution is worse than accepting and accepting the adverse impacts to the bridge and historic district.

Keep Conditions and Stabilize Bridge

A concept or plan to stabilize existing conditions would avoid averse impacts by keeping the abandoned water line within the bridge and keep the original parapets since they would not need to be removed and replaced with a new and approved design. Visual adverse impacts on the bridge and historic district may also be avoided.

However, in order to keep existing conditions and stabilize the bridge would require an extensive amount of reinforcement wiring, bracing, and anchor tie-rods to ensure that the bridge is safely operable. Given the extensive amount of cracking and deterioration of the arches, walls, piers, and overall structural functions, so much

stabilization methods would be needed that the bridge would not really be supporting itself. Stabilization methods would only be, at most, an intervening measure for eventual replacement. There would be visual adverse effects in any type of stabilization method, too.

To remove the rip-rap placement along the piers to streambank would further neglect its repairs and preventative maintenance.

Rehabilitate Bridge and Close or Modify Vehicular Use

The purpose of the project is to rehabilitate the existing deteriorated conditions of the bridge. This will maintain present and future transportation systems for all modes on travel and ensures the safety and enjoyment for the general public. During the public workshop and subsequent community meetings, consideration and input was suggested to close the bridge for vehicle use (except under emergency situations) or limit the bridge to one way traffic. Owners of the bridge, surrounding roads, park, and park area (i.e the city of Wilmington) have already sated their position as well as other community groups that live in the immediate area that the bridge not be closed or altered to motorized traffic by any means (except under special conditions such and planed events within the park). Political representatives, community leaders, and park officials have also indicated their desire to maintain existing traffic patterns.

If this option were ever pursued, a case can be made that bridge closure or limitation will divert, impact, and burden transportation accessibility of surrounding roads which are as equally sensitive to the existing location. This would inhibit emergency responses, recreational opportunities, parkland and recreational accessibility, added traffic burdens to nearby roads, bridges, or communities.

Typical Section and Balustrade Parapet Design Options

The development of rehabilitation/reconstruction alternatives considered a wide range of ideas and included extensive agency and public coordination and comment. DelDOTs original proposal was an attempt to best accommodate transportation, safety and historic/aesthetic elements. This alternative involved significant widening to include two fourteen foot lanes , two five foot sidewalks, and the Texas T type parapet. In the view of the SHPO, this alternative represented the most radical change to the original structure and would have resulted in the most severe adverse effects. Through the extensive consultation program undertaken for this project , a more compatible design was developed. Alternative design issues focused on compromises concerning the typical section, and therefore, overall bridge width and the parapet design.

The existing open balustrade sections of the bridge parapet do not meet safety standards for vehicle deflection, they fail AASHTO design and safety standards.

Therefore, they must either be replaced with an approved parapet option, or, as an alternative option, a protective guardrail could be placed in front of the current parapets. The drawback of a protective guardrail is that installation would require either widening or cantilevering the bridge deck to maintain the existing section or, decreasing an already narrow and substandard travel width and potentially removing sidewalks. Neither structurally widening the deck, nor significantly revising /restricting traffic and pedestrian access patterns were acceptable alternatives.

Another option to allow the use of ornate balusters sections would require, to meet minimum safety requirements, a metal or concrete wheel/bumper guard be installed along the face of the curb and sidewalk. This additional railing is necessary due to existing balustrade sections failing crash and safety design standards (due to the snagging presence, not crashing through them or # of accidents on bridge as one may infer). The current design exception in the width of the travel surface is conditioned on the incorporation of the approved, crash worthy parapets.

In addition, a protective guard rail may present a significant safety concern within the park due to the amount of youths/pedestrians that visit and use this bridge. One concern, along with others, is that youths (or even adults) will walk along the top of this railing and fall/jump/slip into travel lanes or rail gaps and sustain serious personal injury. To some, an added wheel/bumper guard is also an unattractive visual concept which may constitute as more of an adverse effect to the bridge and project area. In consultation with the DE SHPO and interested parties, the majority of the community and governing bodies, felt that a metal guardrail placed on top of the curb, constituted as an adverse effect in not only its appearance, but in the need to widen the bridge to provide the loss of travel and sidewalk width. The DE SHPO and all other interested parties do not want the bridge widened and are willing to accept the new modified parapet design.

Thus, if an approved rail is not placed on the bridge, design criteria would warrant adverse effects which are not accepted by the DE SHPO and other interested parties.

Adding more reinforcement to the new balustrade designs, or looping/threading cable wires within the balustrade design does not eliminate the snagging effects one would experience during a vehicle strike on the parapet.

Taking into consideration all of the concerns; historic preservation, safety, traffic/access requirements, pedestrian access needs, agency and community input, the proposed typical section and parapet design evolved. The Detroit Superior Bridge Railing parapet type best mimics the architectural flair of earlier bridge designs, while providing for necessary current safety requirements. Plan details are provided in appendix I.